

ABSTRACT OF THE DISCLOSURE

A process for making a local interconnect and the structures formed thereby. The process is practiced by forming a Ti layer having a nitrogen-rich upper portion over a portion of a substrate, forming a refractory metal layer on the Ti layer, forming a Si layer on the refractory metal layer, removing a portion of the Si layer, and heating to form a local interconnect structure. During this process, a source structure for the local interconnect is formed. This source structure comprises a Ti layer having a nitrogen-rich upper portion overlying a portion of a substrate, a refractory metal layer overlying the Ti layer, and a silicon layer overlying the refractory metal layer. The resulting local interconnect comprises a titanium silicide layer disposed on a portion of a substrate, a nitrogen-rich Ti layer disposed on the titanium silicide layer, and a refractory-metal silicide layer disposed on the nitrogen-rich Ti layer. The local interconnect is especially useful for reducing cratering and consumption of silicon regions underlying the local interconnect.

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